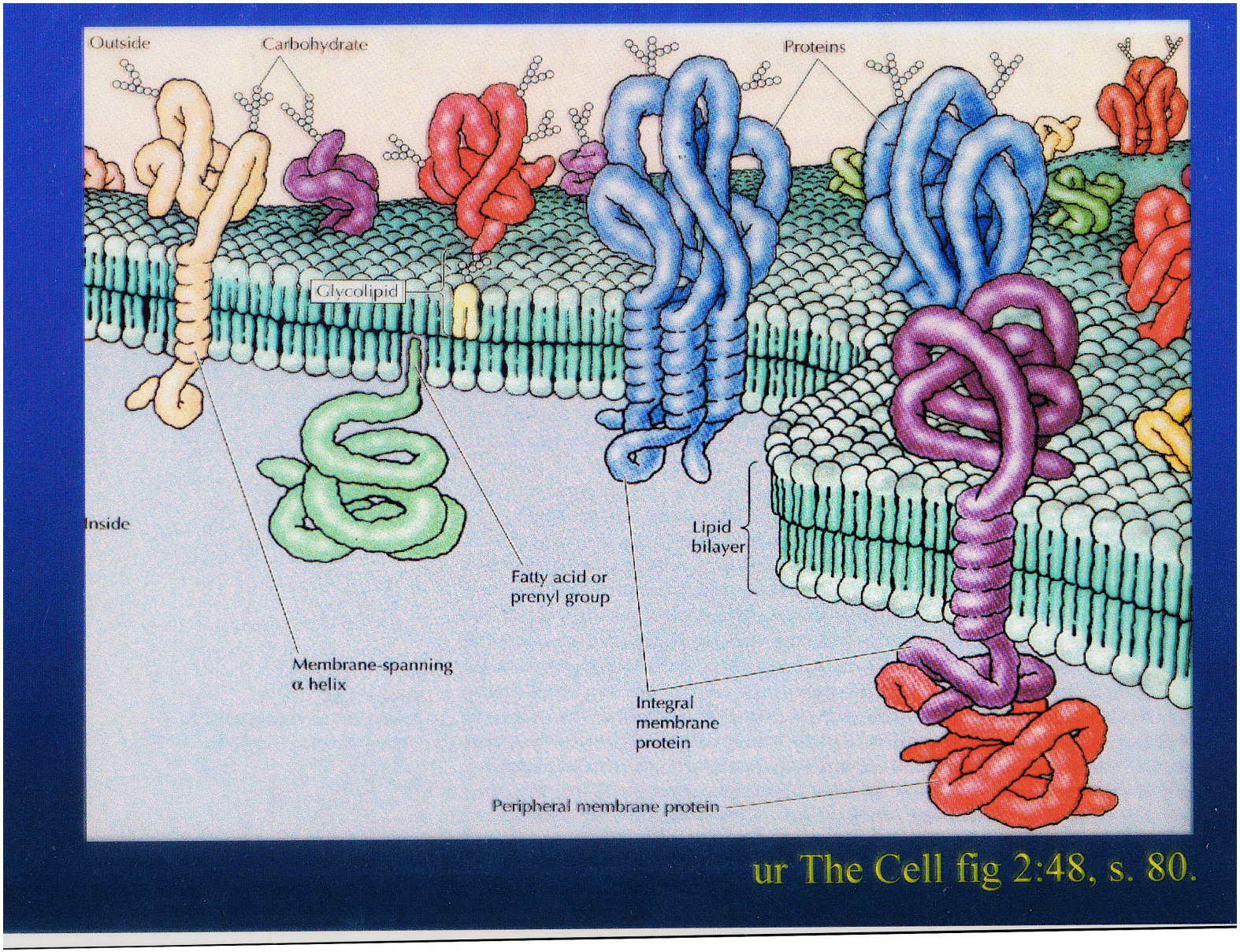
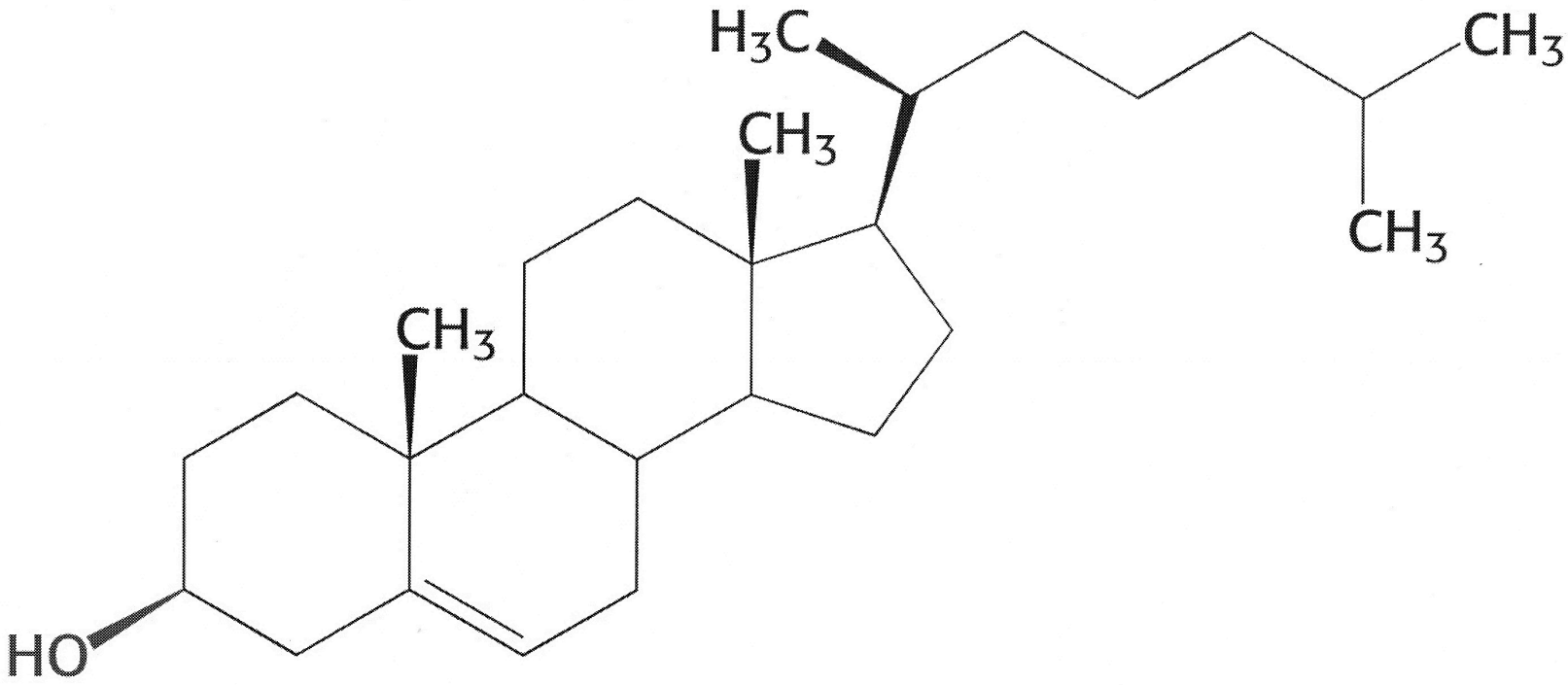
CELLMEMBRANETS ARKITEKTUR





Cholesterol

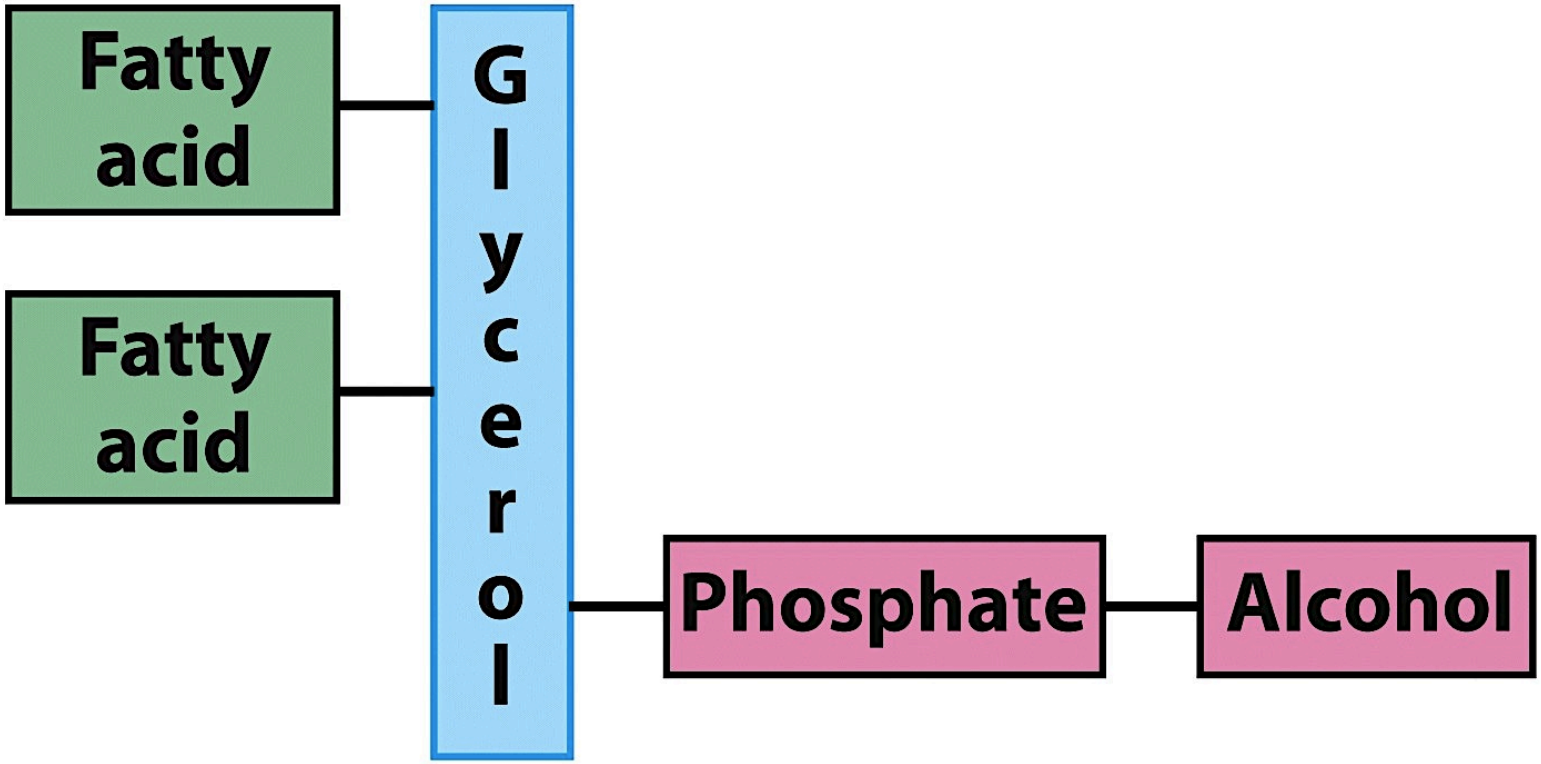
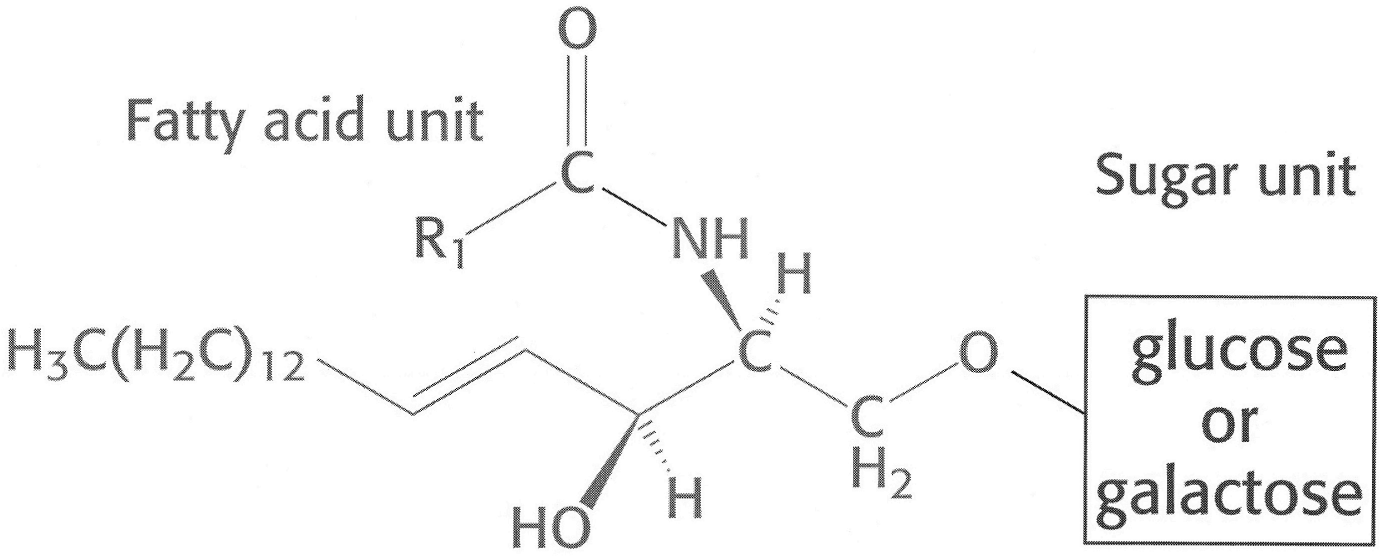


Figure 12.3
***Biochemistry,* Seventh Edition**



Cerebroside
(a glycolipid)

Bilayer

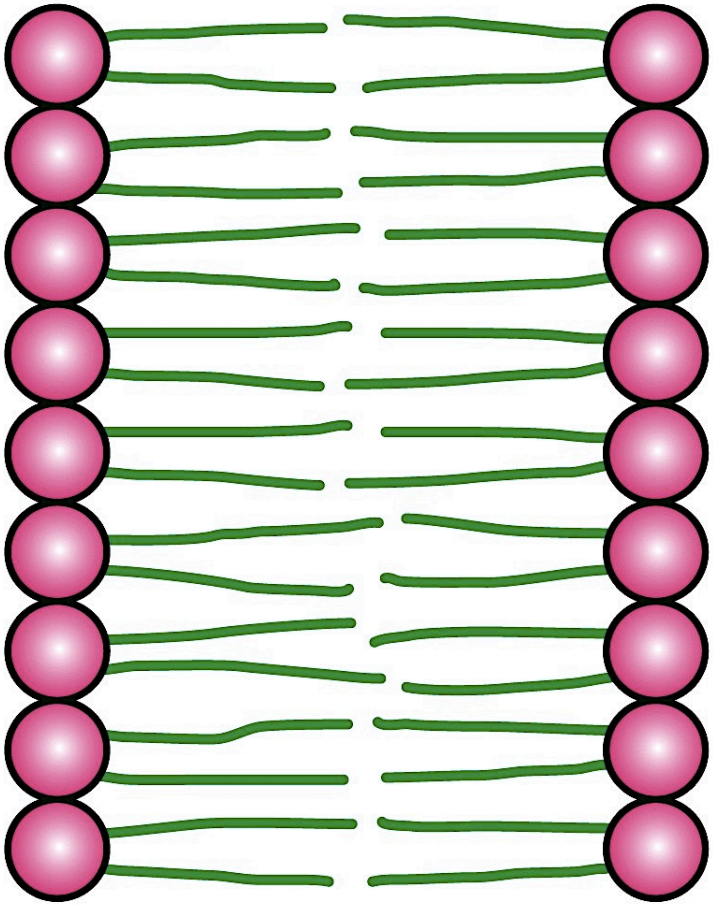


Figure 12.10
***Biochemistry,* Seventh Edition**

Bilayer

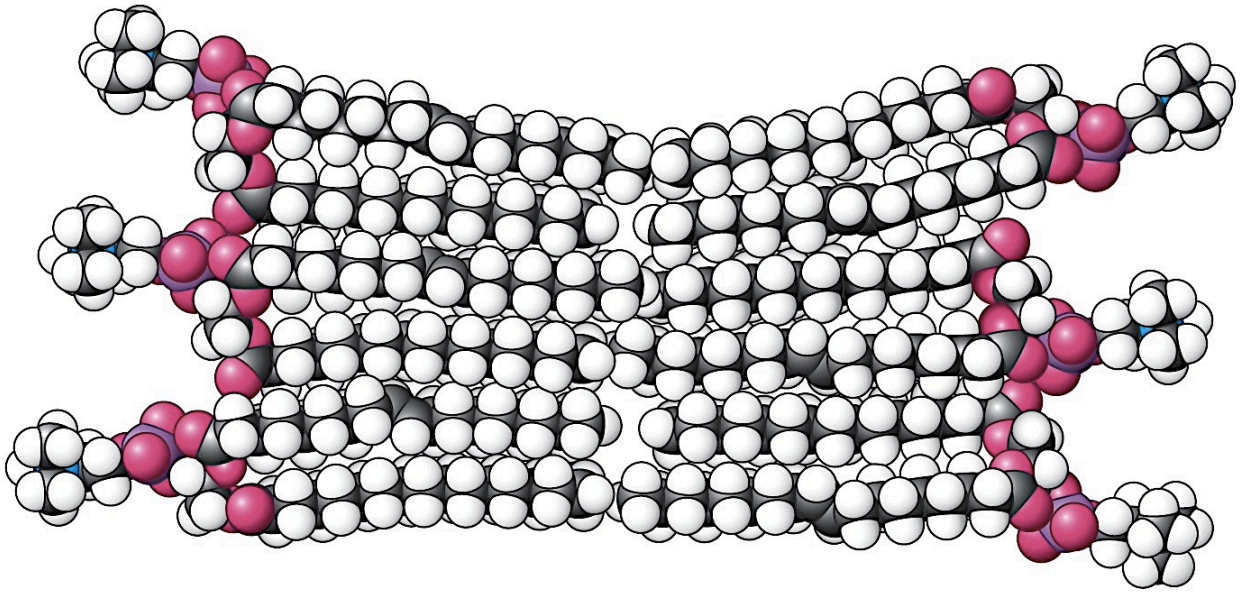


Figure 12.11a
***Biochemistry,* Seventh Edition**

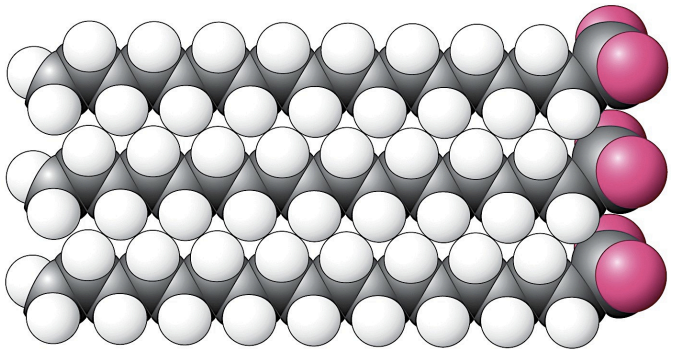


Figure 12.32a
***Biochemistry,* Seventh Edition**

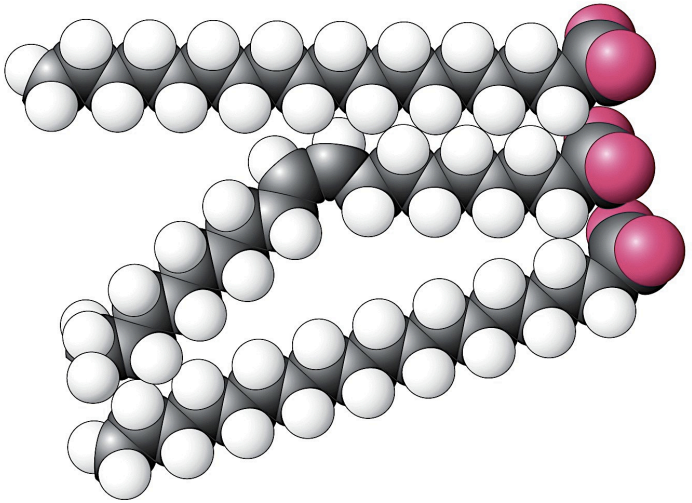


Figure 12.32b
***Biochemistry,* Seventh Edition**

Bilayer

Omättade fettsyror

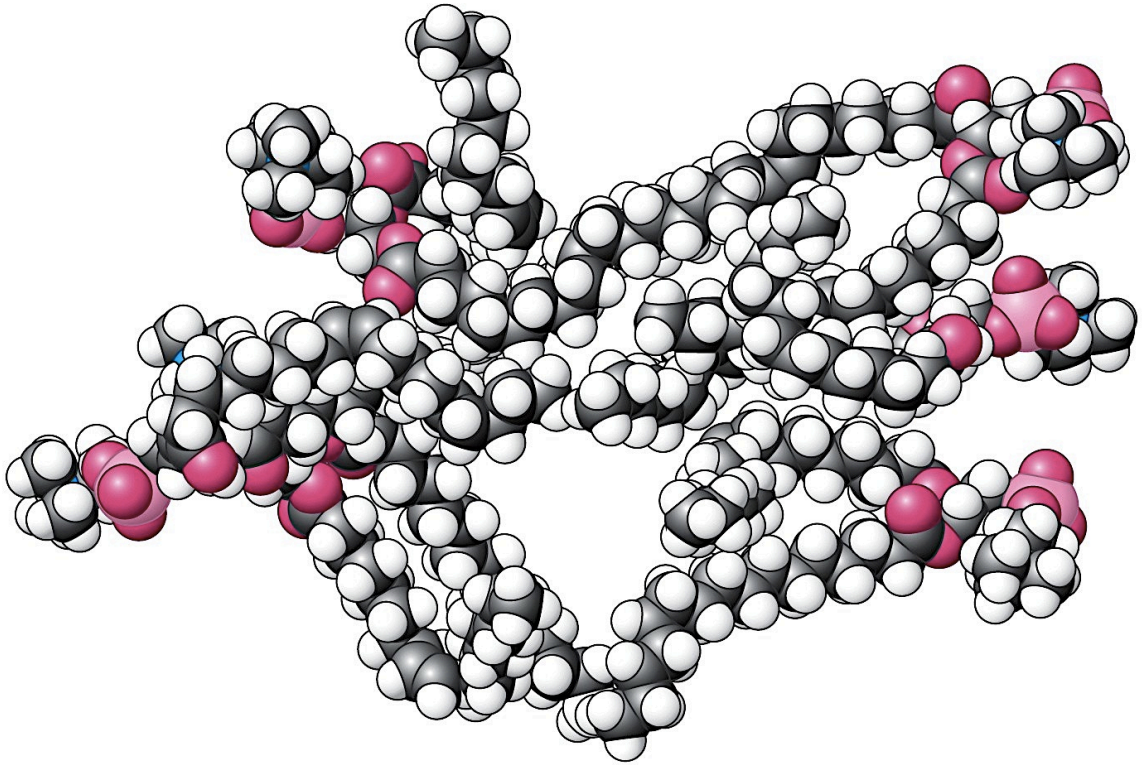


Figure 12.11b
***Biochemistry*, Seventh Edition**

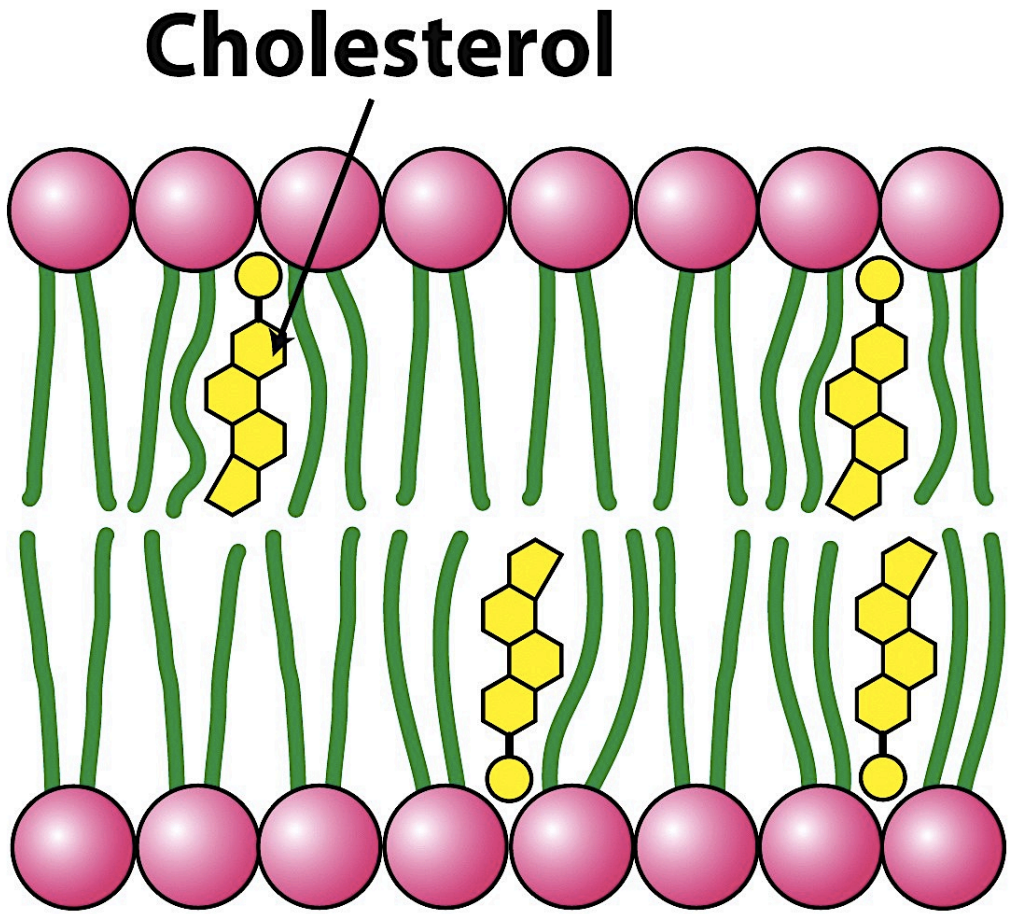
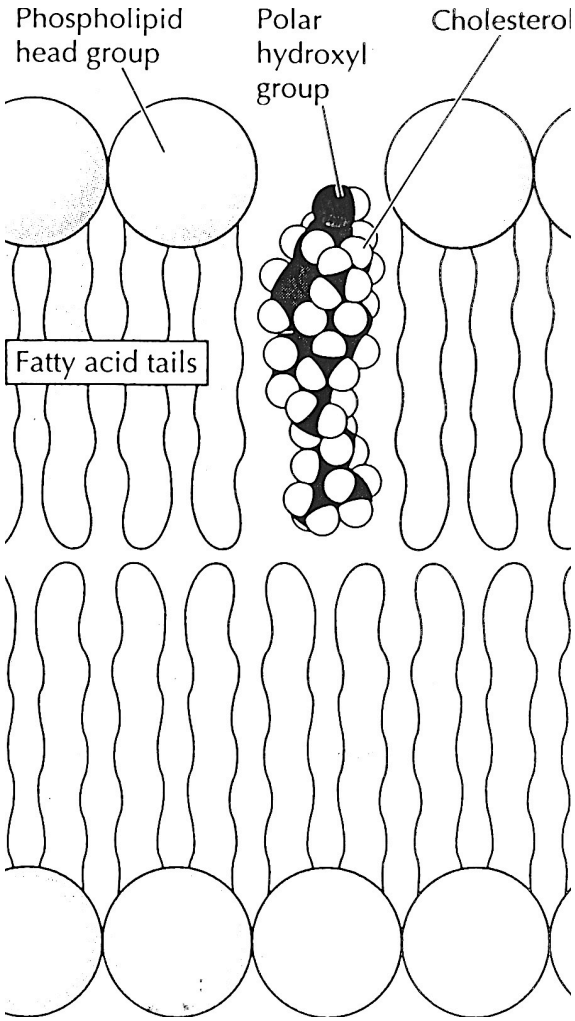
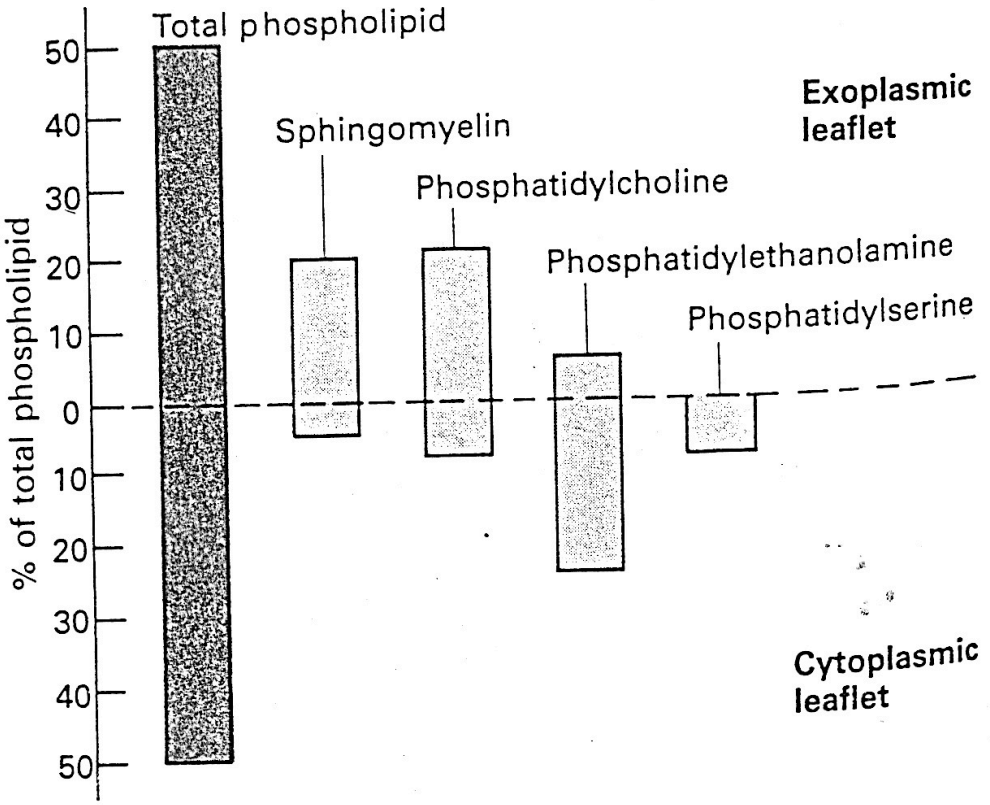


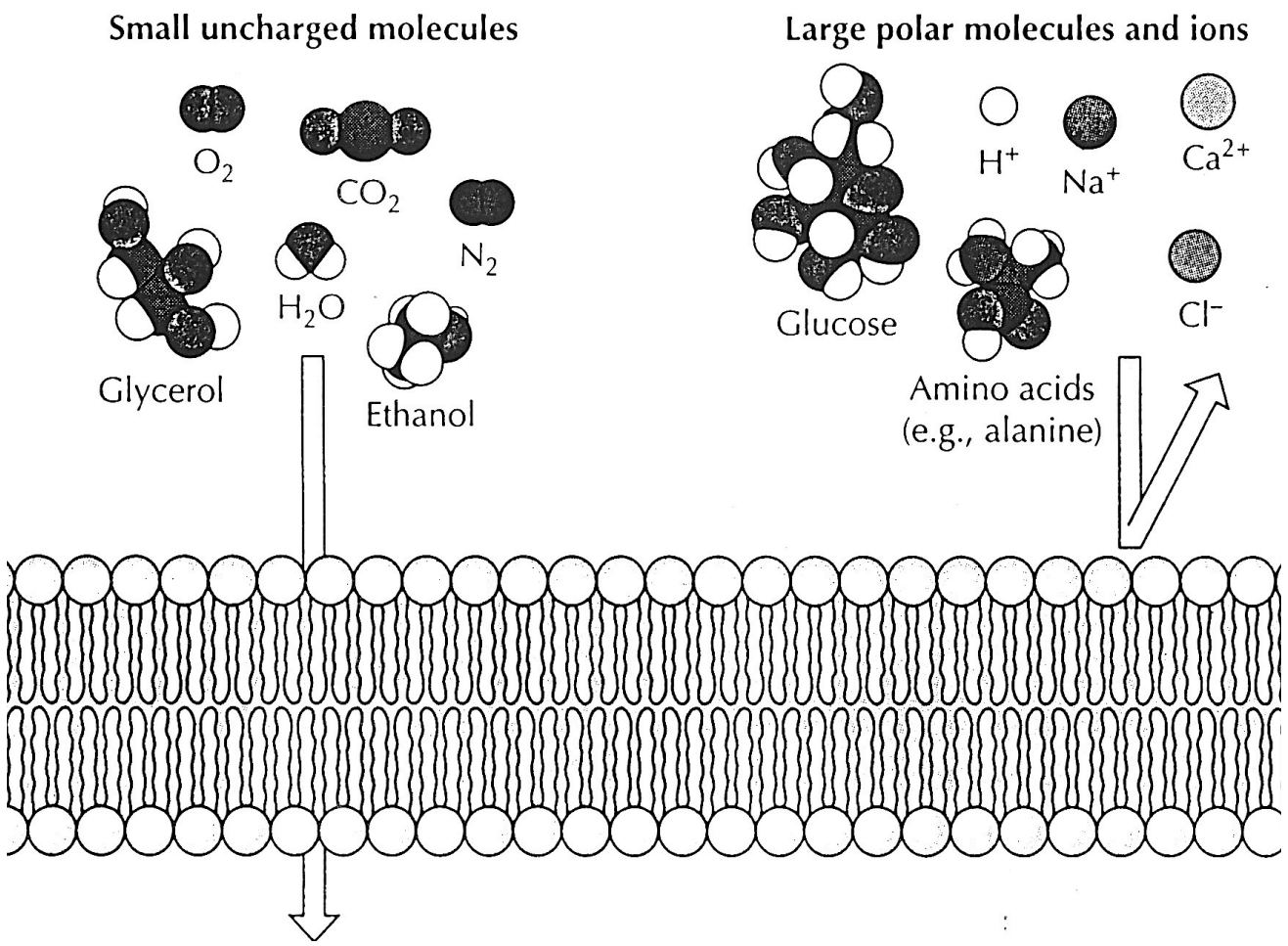
Figure 12.33
***Biochemistry,* Seventh Edition**


Phospholipid head group
Polar hydroxyl group
Cholesterol
Fatty acid tails

Membrane	Protein	Lipid	Carbohydrate
Myelin	18%	79%	3%
Erytrocyte	49%	43%	8%
Liver	44%	52%	4%



▲ **Figure 13-21** Distribution of phospholipids in the two leaflets of the erythrocyte plasma membrane. Values are expressed as a percentage of total membrane lipids. Note that 50 percent of the total phospholipid is found in each face. [See J. E. Rothman and J. Lenard, 1977, *Science* 195:743.]


Small uncharged molecules
Large polar molecules and ions
O_2
CO_2
N_2
H_2O
Glycerol
Ethanol
Glucose
H^+
Na^+
Ca^{2+}
Cl^-
Amino acids
(e.g., alanine)

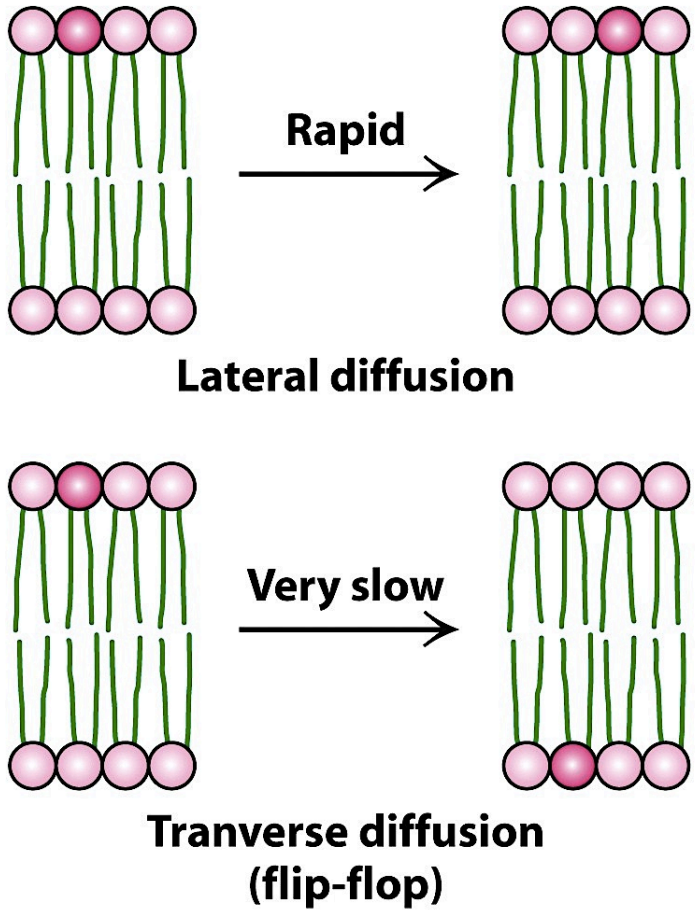
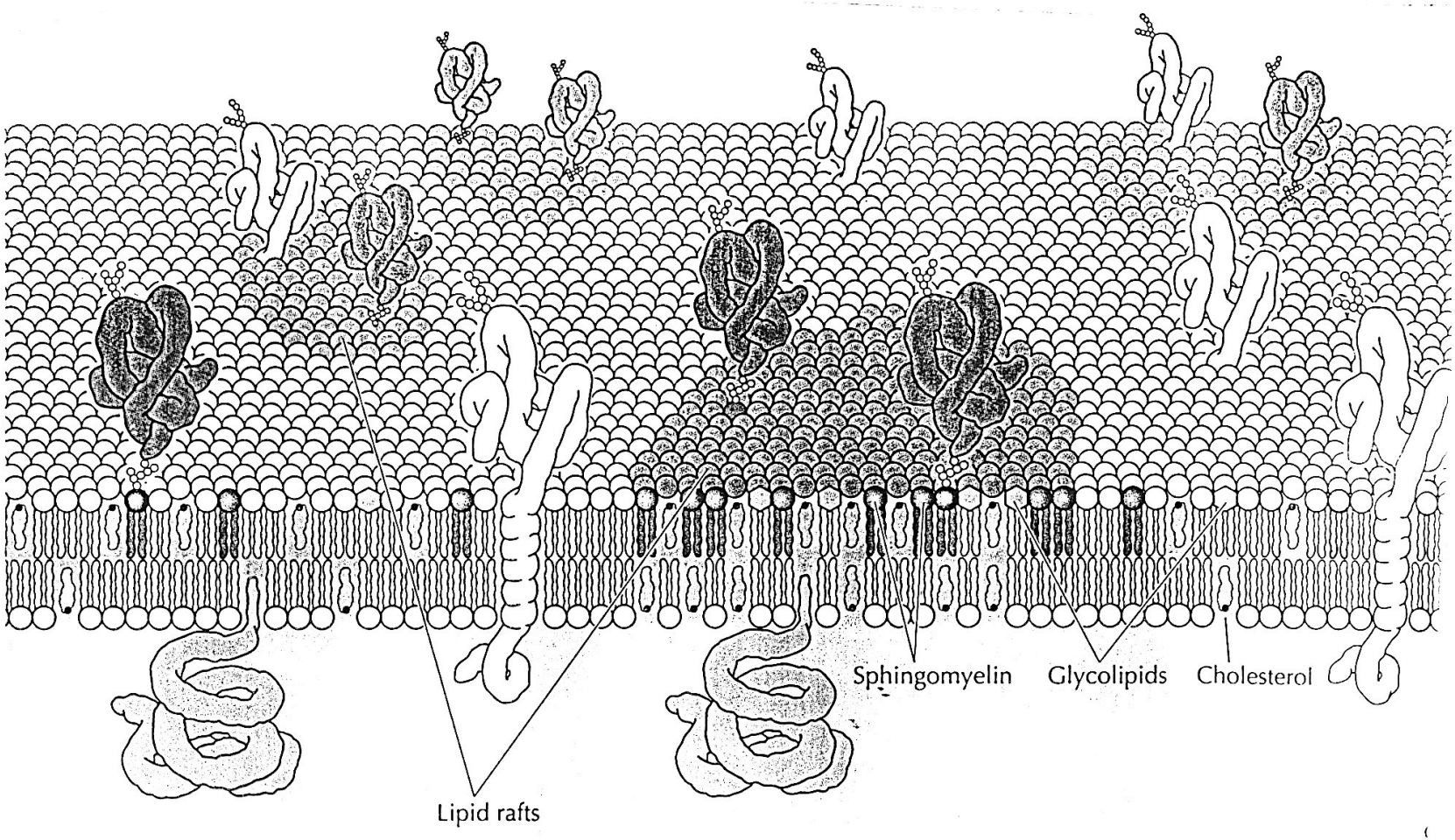


Figure 12.30
***Biochemistry*, Seventh Edition**

Lipid rafts



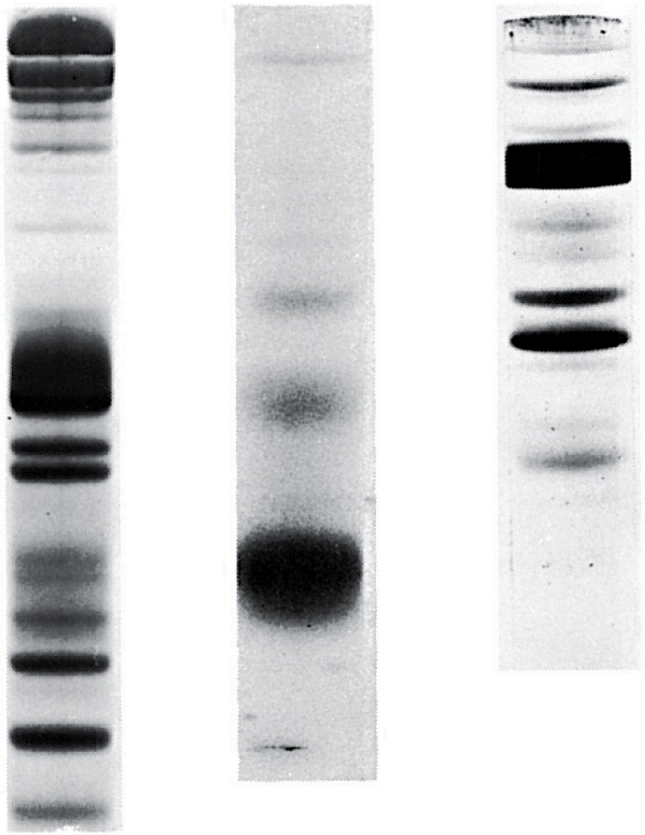


Figure 12.16
***Biochemistry,* Seventh Edition**

Membranproteiner

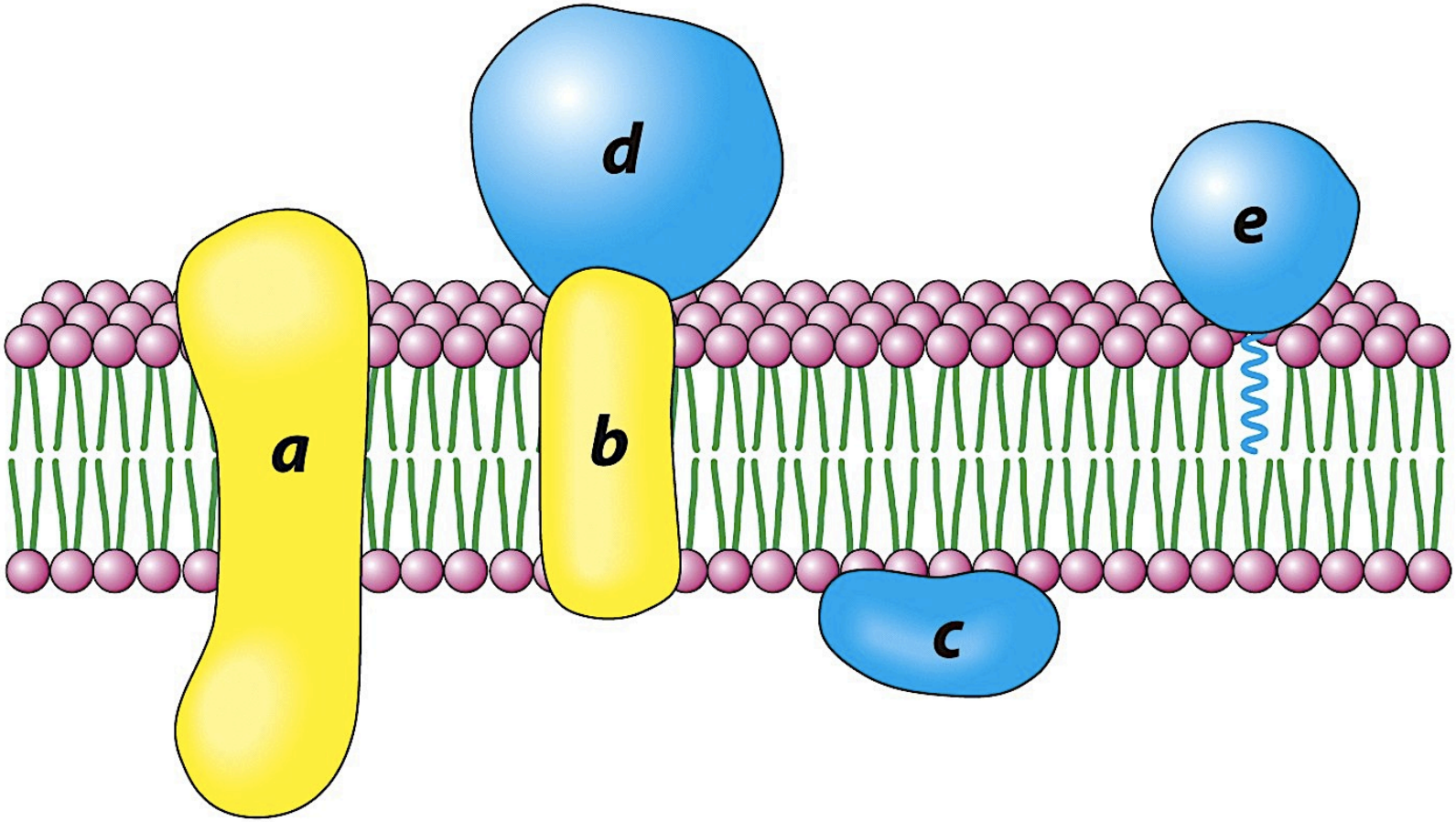


Figure 12.17
***Biochemistry*, Seventh Edition**

Typ 1: Alfahelix(ar)

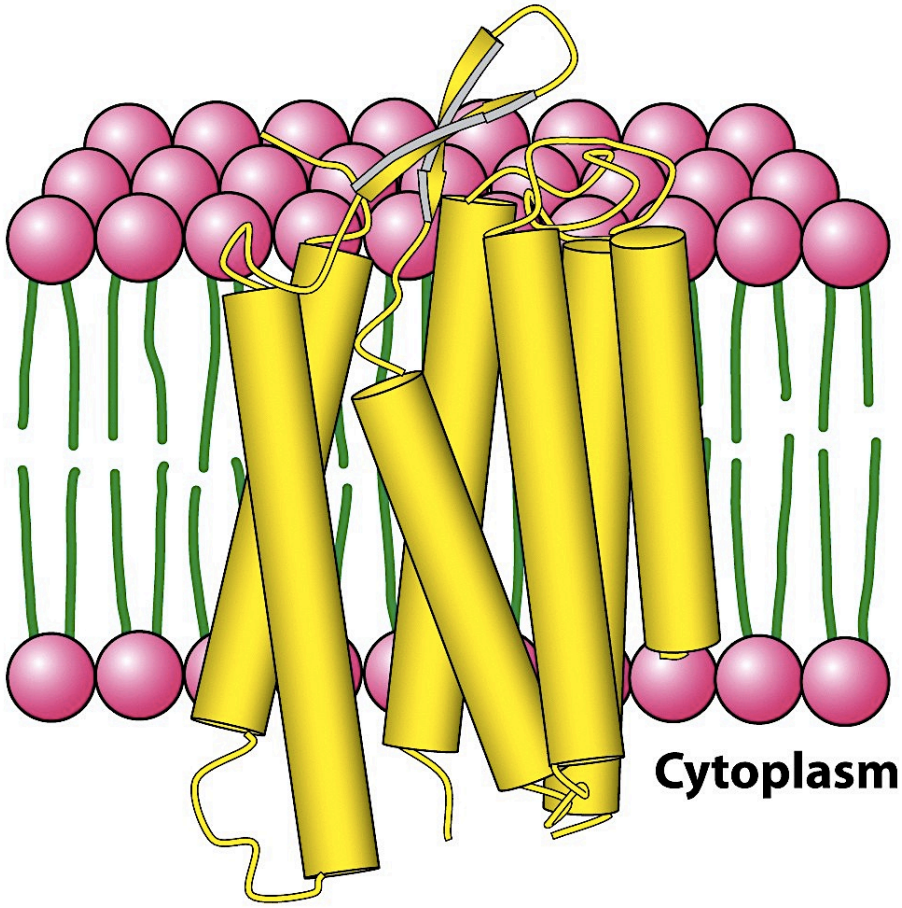


Figure 12.18a
***Biochemistry,* Seventh Edition**

Typ 2: Beta-barrel

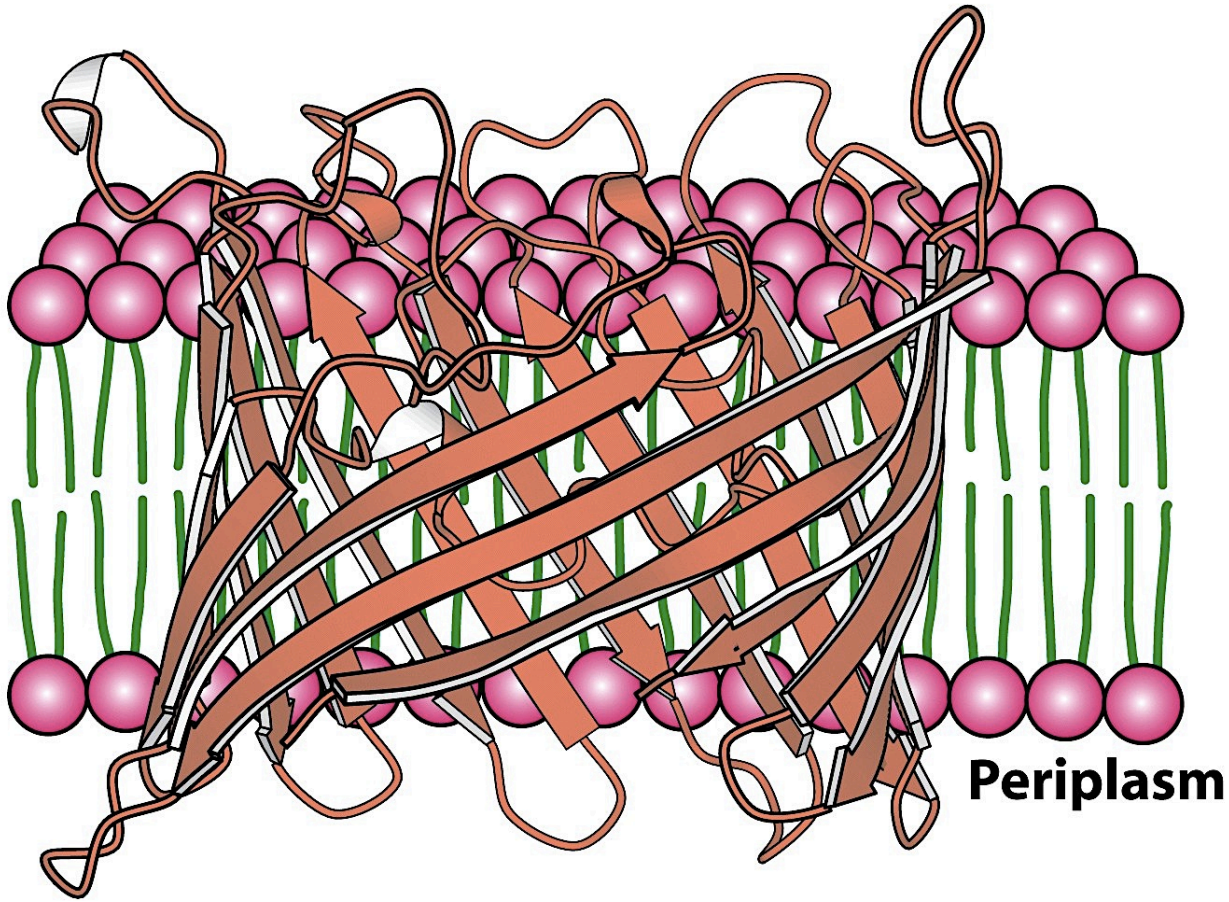


Figure 12.20a
***Biochemistry*, Seventh Edition**

Typ 3: ”Partiellt associerade”

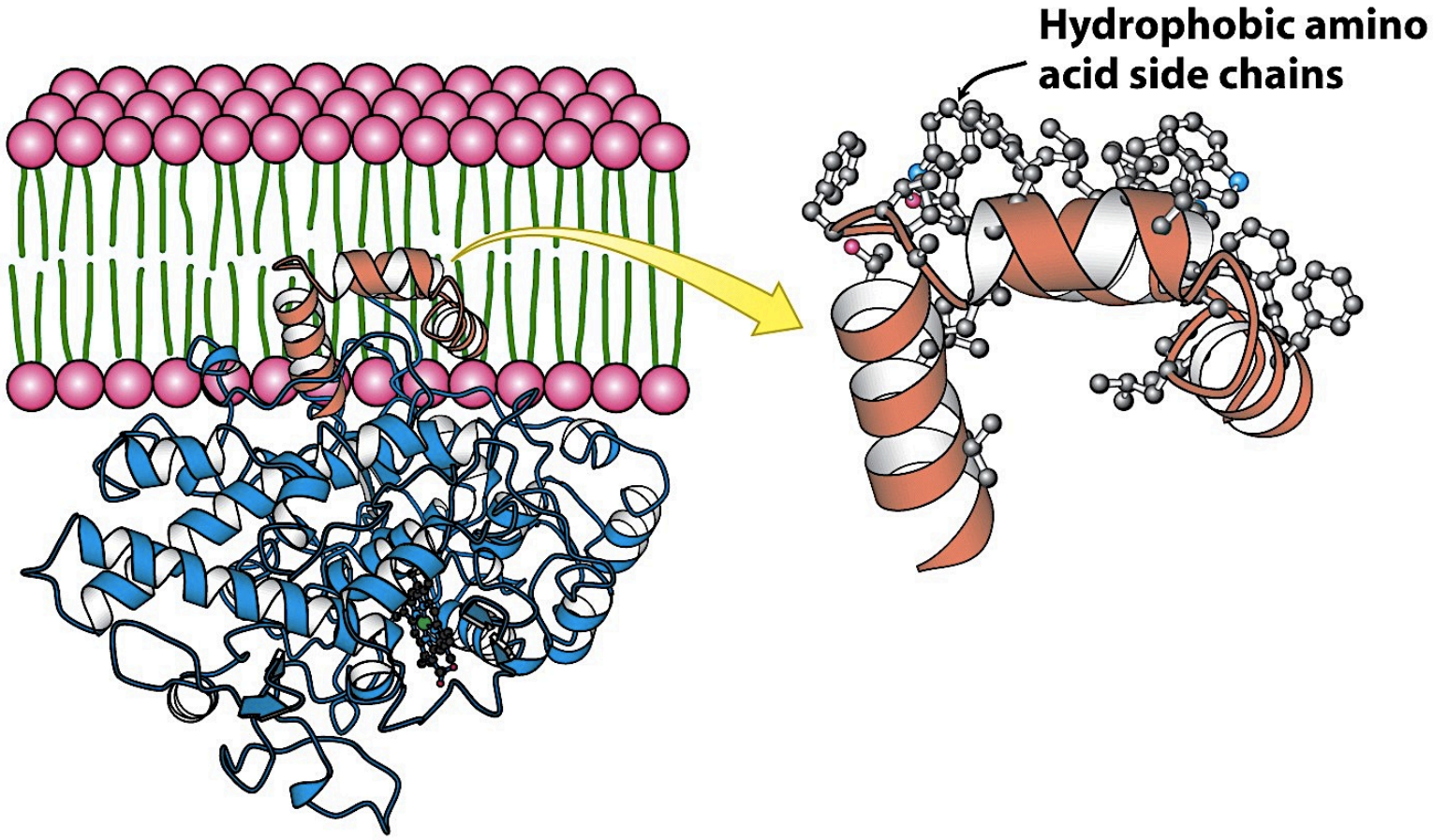


Figure 12.23
***Biochemistry*, Seventh Edition**

Table 12.2 Polarity scale for identifying transmembrane helices

Amino acid residue	Transfer free energy in kJ mol^{-1} (kcal mol^{-1})
Phe	15.5 (3.7)
Met	14.3 (3.4)
Ile	13.0 (3.1)
Leu	11.8 (2.8)
Val	10.9 (2.6)
Cys	8.4 (2.0)
Trp	8.0 (1.9)
Ala	6.7 (1.6)
Thr	5.0 (1.2)
Gly	4.2 (1.0)
Ser	2.5 (0.6)
Pro	−0.8 (−0.2)
Tyr	−2.9 (−0.7)
His	−12.6 (−3.0)
Gln	−17.2 (−4.1)
Asn	−20.2 (−4.8)
Glu	−34.4 (−8.2)
Lys	−37.0 (−8.8)
Asp	−38.6 (−9.2)
Arg	−51.7 (−12.3)

Source: After D. M. Engelman, T. A. Steitz, and A. Goldman. 15(1986):321–353.
Note: The free energies are for the transfer of an amino acid residue in an α helix from the membrane interior (assumed to have a dielectric constant of 2) to water.

Table 12.2
***Biochemistry*, Seventh Edition**

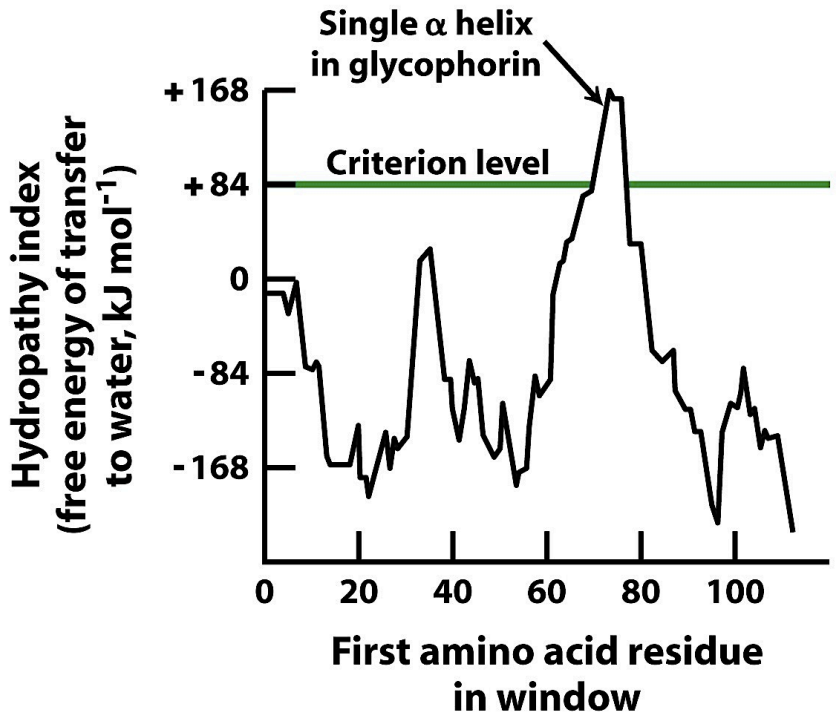


Figure 12.27b
***Biochemistry*, Seventh Edition**

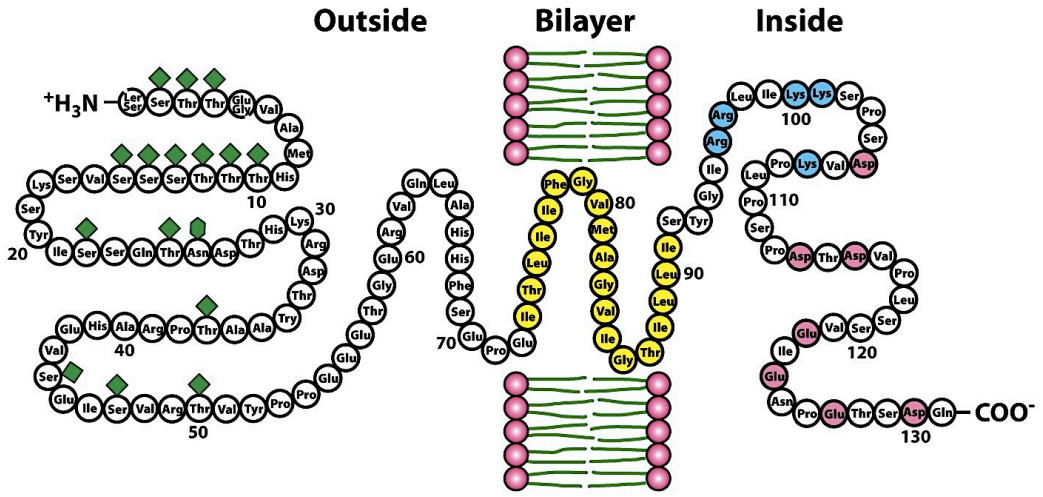
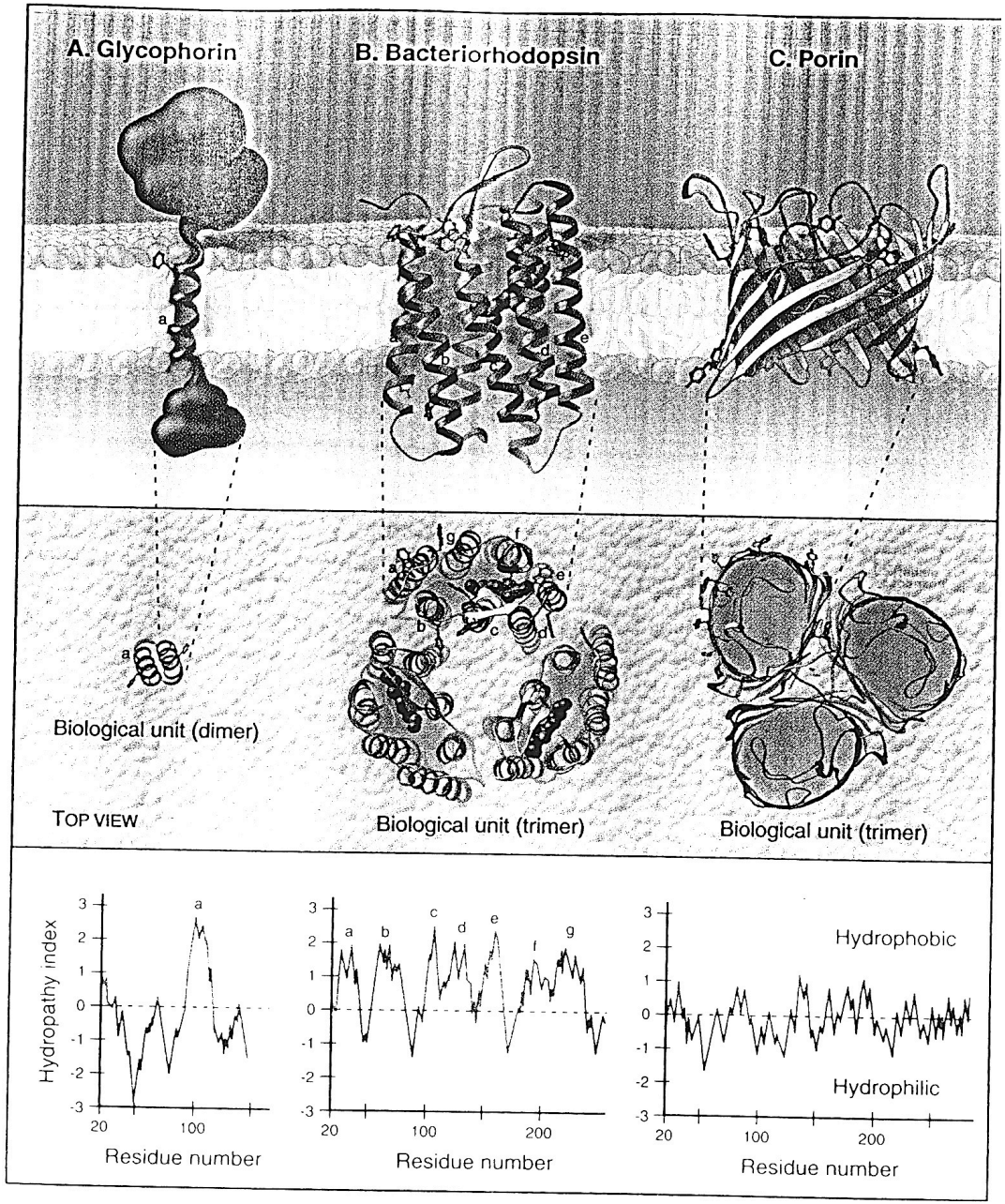


Figure 12.27a
***Biochemistry*, Seventh Edition**


A. Glycophorin
B. Bacteriorhodopsin
C. Porin
Biological unit (dimer)
TOP VIEW
Biological unit (trimer)
Biological unit (trimer)
Hydropathy index
Residue number
Residue number
Residue number
Hydrophobic
Hydrophilic

PERIFERA MEMBRAMPROTEINER

Strategier för association med cell membranet

1. Isoprenoid- (Farnesyl-) svans: 15C kedja associeras till cystein nära C-terminalen
   Ex GTPas, Ras

2. Myristoylsvans: 14C kedja bunden till N-terminal glycin
   Ex tyrosinkinas Src

3. **GPI-ankare/glycosylfosfatidylinositol-svans:** Proteinets C-terminal är kovalent bunden till oligosackariden
   Ex Acetylkolinesteras, T-cadherin, Thy-1
   OBS FOSFOLIPAS

4. Elektrostatiska interaktioner med fosfolipider
   Cytoplasmatiska proteiner ex annexin

5. Association med integrala proteiner
   Ex "cellskelett-proteiner"

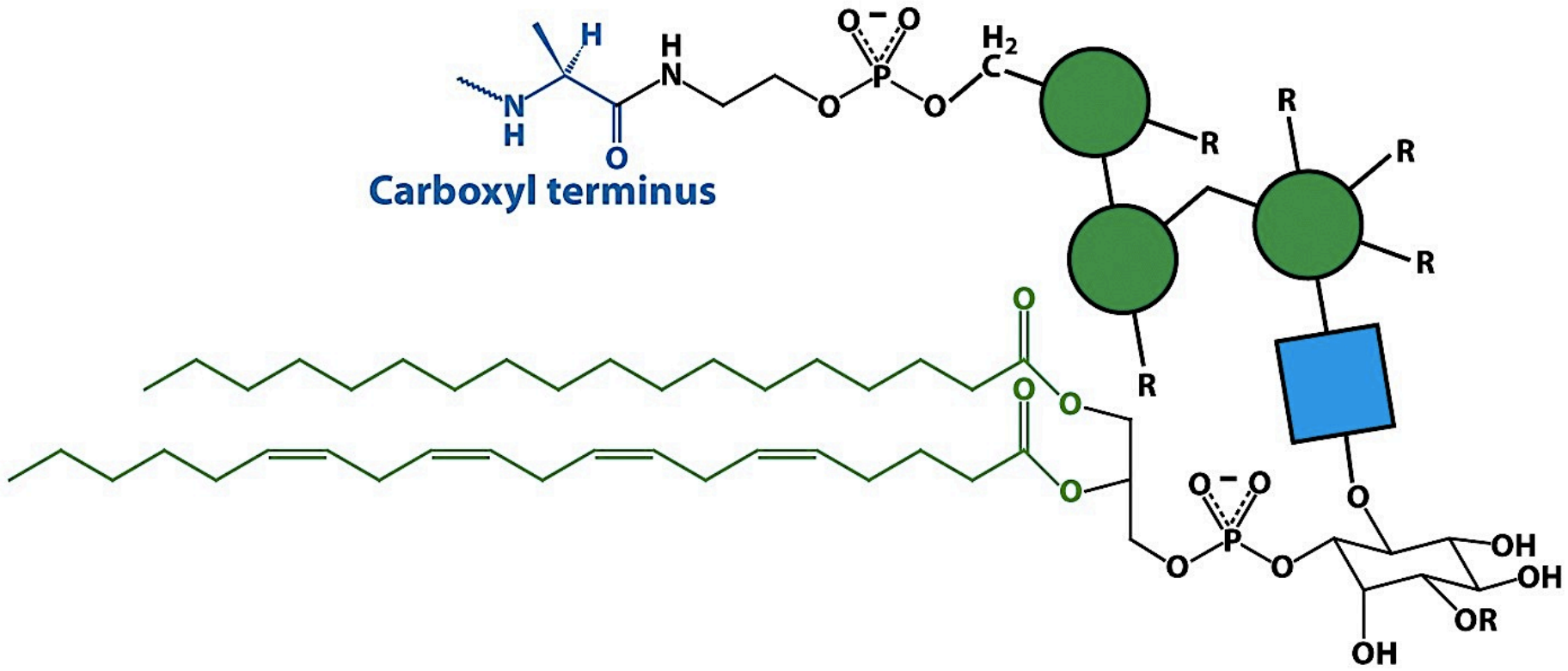


Figure 12.26 part 3
***Biochemistry*, Seventh Edition**

Cellytans kolhydrater

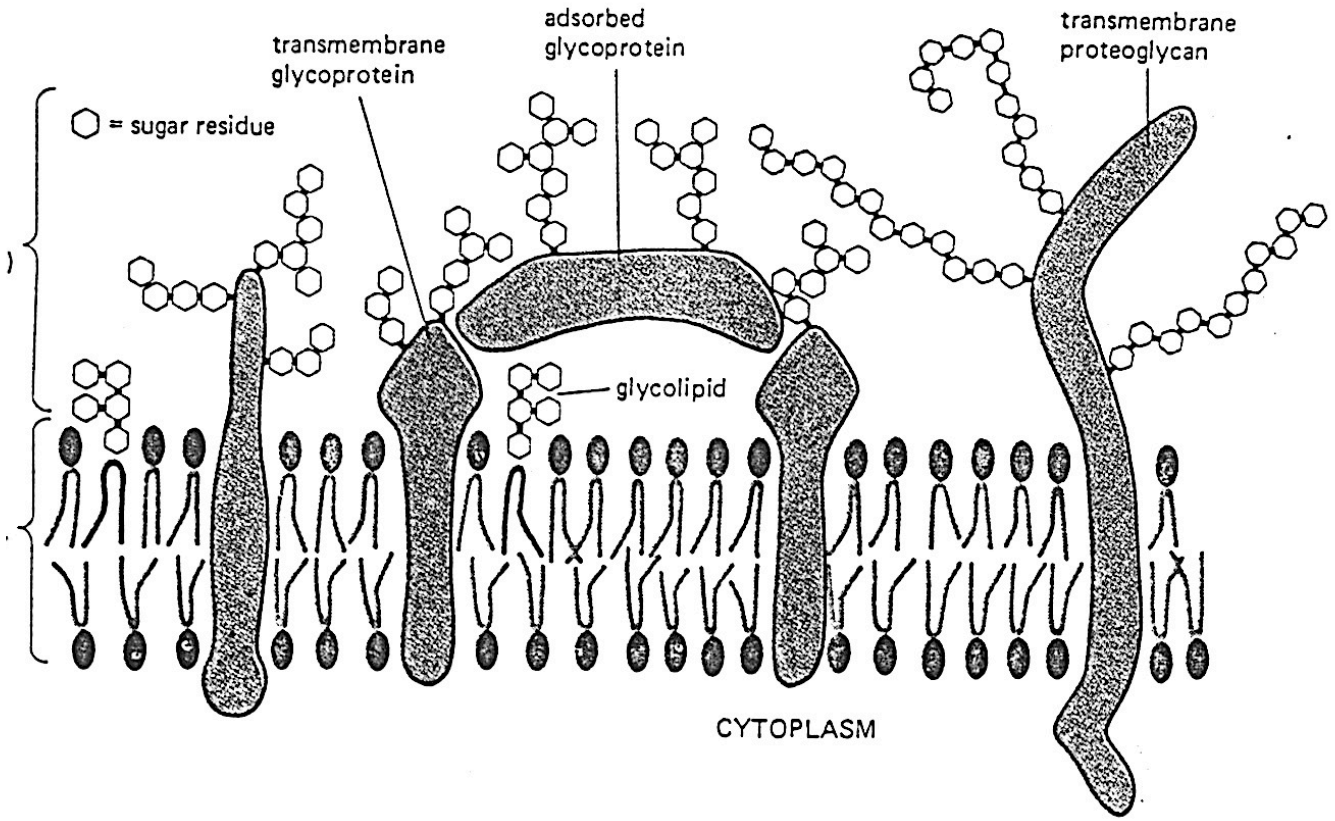
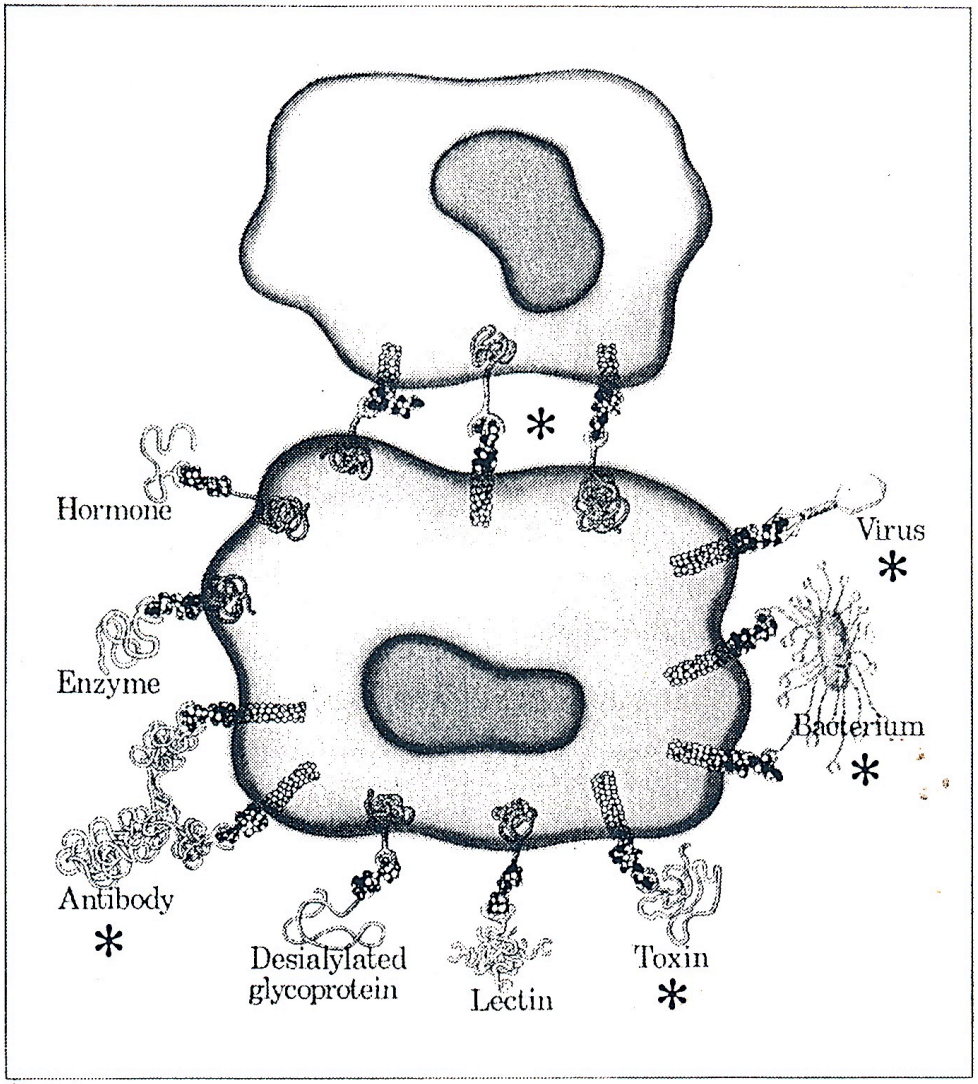


Figure 6–40 Diagram of
(glycocalyx), which is mad
oligosaccharide side chain
glycolipids and integral me
glycoproteins, and polysac
chains on integral proteogl
addition, adsorbed glycopr
adsorbed proteoglycans (n
contribute to the glycocaly
cells. Note that all of the ca
is on the outside of the me
Some integral glycoprotein
proteoglycans are covalentl
phosphatidylinositol in the
monolayers of the plasma
via a specific oligosacchari
shown, but see Figure 6–14

Various ligands interacting with cell surface carbohydrates



Koleratoxin från *Vibrio cholerae*

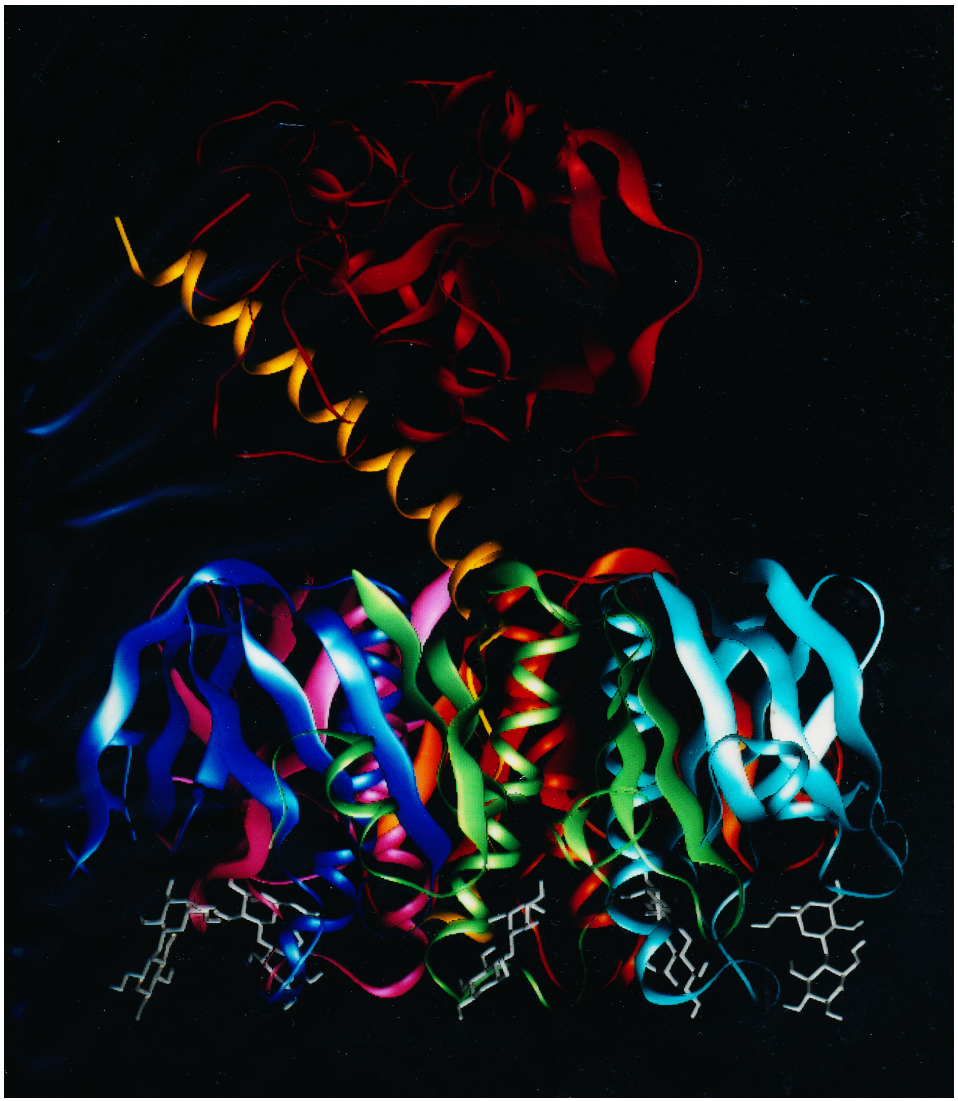


Table 12.3 Cell Adhesion Molecules

Family	Ligands recognized	Stable cell junctions
Selectins	Carbohydrates	No
Integrins	Extracellular matrix	Focal adhesions and hemidesmosomes
	Members of Ig superfamily	No
Ig superfamily	Integrins	No
	Homophilic interactions	No
Cadherins	Homophilic interactions	Adherens junctions and desmosomes

Selektiner

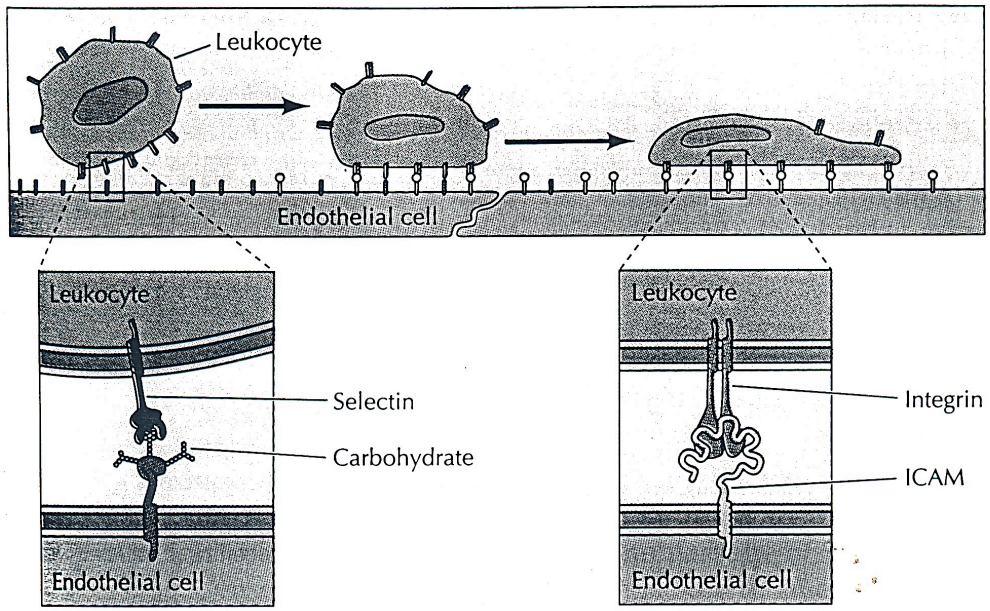
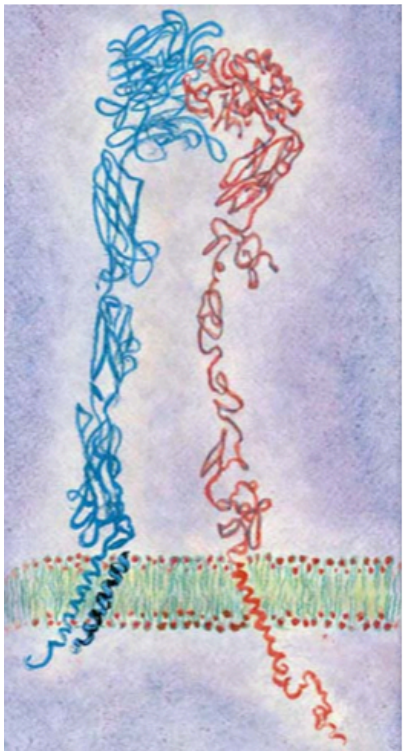
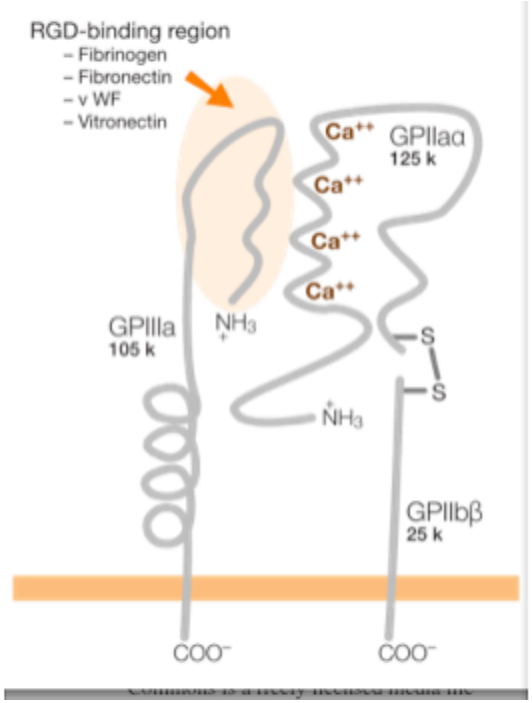
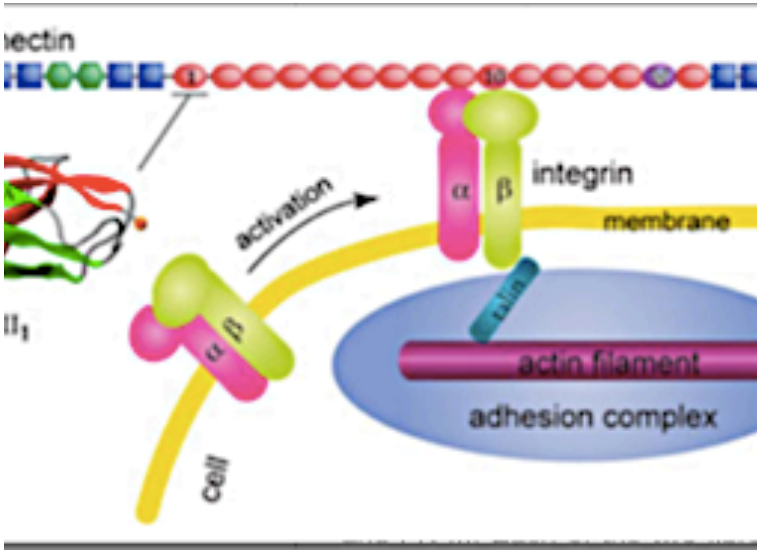


Figure 12.62
Adhesion between leukocytes and endothelial cells Leukocytes leave the circulation at sites of tissue inflammation by interacting with the endothelial cells of capillary walls. The first step in this interaction is the binding of leukocyte selectins to carbohydrate ligands on the endothelial cell surface. This step is followed by more stable interactions between leukocyte integrins and members of the Ig superfamily (ICAMs) on endothelial cells.

Integriner




RGD-binding region
– Fibrinogen
– Fibronectin
– v WF
– Vitronectin
Ca++
Ca++
Ca++
Ca++
GPIIaα
125 k
GPIIIa
105 k
NH3
S
S
NH3
GPIIbβ
25 k
COO⁻
COO⁻


ectin
integrin
membrane
activation
actin filament
adhesion complex
cell

Cadheriner

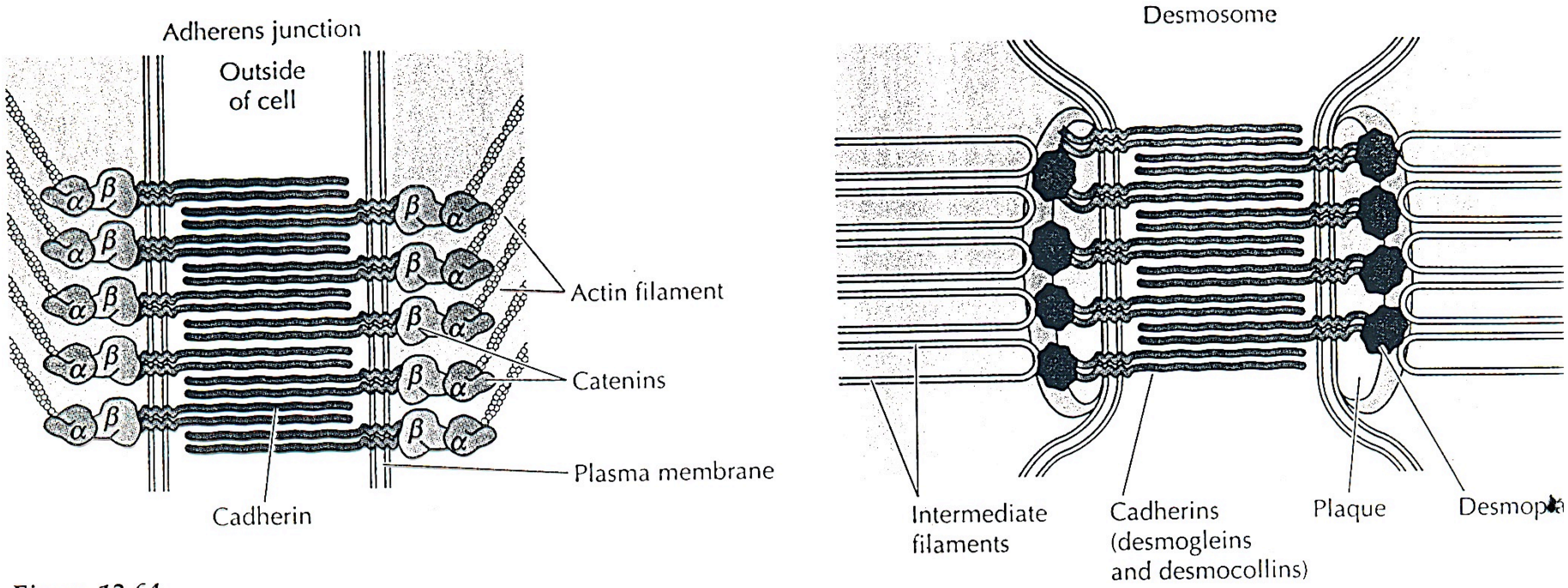


Figure 12.64
Stable cell-cell junctions mediated by the cadherins Homophilic interactions between cadherins mediate two types of stable cell-cell adhesions. In adherens junctions, the cadherins are linked to bundles of actin filaments via the catenins (see Figure 11.14). In desmosomes, desmoplakin links members of the cadherin superfamily (desmogleins and desmocollins) to intermediate filaments (see Figure 11.34).